

REMARKS

By the present Amendment, editorial revisions have been made in the specification, claims 1 and 2 have been canceled without prejudice or disclaimer, method claim 3 has been placed into independent form based on the subject matter provided in the specification in the passage beginning at page 4, line 9 with the contact time now recited for Process (II) being described in the paragraph beginning at page 9, line 8. Finally, new claims 5 (relating to a binder resin for a toner) and 6 (relating to a toner for electrophotography) have been added with both claims depending directly or indirectly from claim 3.

As now recited in claim 3, one aspect of the present invention provides a method for producing a binder resin (A) for a toner comprising defined processes (I), (II) and (III) in that order. Process (I) comprises melt-mixing a carboxyl group-containing vinyl resin (B) obtained by copolymerizing a vinyl monomer selected from a defined group and a vinyl monomer having a carboxyl group selected from a defined group, and an epoxy group-containing vinyl resin (C) obtained by copolymerizing a vinyl monomer selected from a defined group and a vinyl monomer having epoxy group selected from a defined group at a defined temperature in a twin screw extruder for the reaction. Process (II) comprises introducing water into the twin screw extruder and mixing water with the resin composition for 0.1 second to 5 seconds under defined conditions while Process (III) comprises reducing the pressure inside the twin screw extruder for removing water and the volatile component.

As can be understood from considering the illustrative Examples provided in the specification, substantial advantages can be obtained. In contrast, as may be

seen from the description provided for Comparative Example 1 on page 15, when water is not injected and a pressure reducing pump is not connected, the amount of volatile components far exceeds that which can be obtained in accordance with the present invention.

In view of the claims now of record and the foregoing discussion, applicants respectfully submit that the presently claimed invention cannot be rejected over the prior art of record. In particular, Iwa et al., U.S. Patent Application Publication No. 2002/0076637, provides a toner binder for electrophotography and a toner for electrophotography. The binder is prepared in accordance with the method set forth in the passage beginning with paragraph [0043] wherein a vinyl resin (A) containing glycidyl groups is mixed with a vinyl resin (B) containing carboxyl groups in a Henschel mixer and the like, and the mixture is melted and kneaded in biaxial kneader so as to carry out a cross-linking reaction of a carboxyl group and a glycidyl group. Paragraph [0046] states that the resin is cooled and ground to make a toner binder with the cooling method being attained by preferably using a steel belt cooler and the like.

On page 2 of the Official Action , the Examiner has asserted that Iwa et al. discloses the same method of increased temperature and the addition of water to produce the same gel component and binder physical properties. Based on this assertion, the Examiner has concluded that it would be inherent that the amount of volatile components would be less than 200 ppm because the same method is taught by Iwa et al.

Applicants respectfully submit that Iwa et al. does not disclose each and every aspect of the presently claimed method and therefore does not anticipate the claims.

In particular, as set forth in Example 1 in paragraph [0081] of Iwa et al., the resin exiting the biaxial kneader is cooled and ground to make a toner binder for electrophotography. In order to cool the resin, a steel belt cooler is used. The cooling water mentioned in this paragraph is not introduced into the twin screw extruder as recited in Process (II) of amended claim 3. Rather, the cooling water is used to cool the steel belt cooler upon which the resin is applied in order to achieve cooling. Furthermore, the method of Iwa et al. does not involve reducing the pressure inside the twin screw extruder for removing water and volatile component. Since Comparative Example 1 illustrates what can occur without the introduction of water and the application of reduced pressure inside the twin screw extruder, it is without question that the Examiner's reliance on "inherency" cannot be sustained. Thus, not only does the anticipation rejection fail, but it is without question that the claims now of record are patentable over the fair teachings of Iwa et al.

The deficiencies of Iwa et al. are not remedied by the further reliance on JP 2000-143721. For the Examiner's convenience, a more literal translation of certain paragraphs from the JP '721 publication is attached hereto. The JP '721 publication describes the alleged shortcomings of the prior art in paragraphs [0002] and [0003]. In order to address this situation, the publication describes a technique in which devolatilization is performed at a pressure of 1 to 10 kg/cm² G, preferably 3 to 8 kg/cm² G (see paragraph [0011]). The pressure step (ii) is conducted for a period of 3 to 120 minutes, (preferably 15 to 60 minutes) (See paragraph [0012]).

Even if there existed a proper basis for combining the teachings of the JP '721 publication with those of Iwa et al., those of ordinary skill in the art would still not arrive at the presently claimed invention. Amended claim 3 specifically recites in

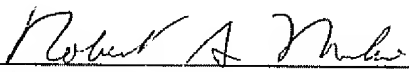
Process (II) a defined pressure range of 1 MPa to 2.7 MPa (which converts to 10.2 kgf/cm² to 27.5 kgf/cm²) and a time of 0.1 second to 5 seconds. The combination of conditions recited in claim 3 is nowhere taught by the JP '721 publication and, following the teachings of this document, would lead those of ordinary skill in the art away from the conditions recited in claim 3. To further emphasize this point, the Examiner's attention is respectfully directed to the results set forth in Example 1 in paragraph [0017] wherein a reaction vessel with a stirrer (as opposed to the recited twin screw extruder) was used at a temperature of 180°C, a pressure of 5 kg/cm² G for 1 hour and resulted in a material with 0.9% of volatile component or 9,000 ppm. As should be evident to those of ordinary skill in the art, this technique is far different from what is set forth in claim 3 and results in a binder resin and toner that is far different from that set forth in claims 5 and 6.

For all of the reasons set forth above, applicants respectfully submit that the claims now of record are patentable over the cited prior art and therefore request reconsideration and allowance of the present application.

Should the Examiner wish to discuss any aspect of the present invention, he is invited to contact the undersigned attorney at the number provided below.

Respectfully submitted,

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